

Claims

- [c1] 1. An electrostatic chuck comprising:
 - a base plate;
 - height adjustment mechanisms connected to said base plate; and
 - electrostatic chuck pins connected to said height adjustment mechanisms.
- [c2] 2. The electrostatic chuck in claim 1, wherein said height adjustment mechanisms individually control the height of each electrostatic chuck pin.
- [c3] 3. The electrostatic chuck in claim 1, wherein said height adjustment mechanisms control the flatness of a device being held by said electrostatic chuck pins.
- [c4] 4. The electrostatic chuck in claim 1, wherein said height adjustment mechanisms compensate for foreign matter particles between said electrostatic chuck pins and a device being held by said electrostatic chuck pins.
- [c5] 5. The electrostatic chuck in claim 1, wherein said height adjustment mechanisms comprise computer-controlled devices.

- [c6] 6.The electrostatic chuck in claim 1, wherein said height adjustment mechanisms comprise devices that automatically maintain a flatness of a device being held by said electrostatic chuck pins.
- [c7] 7.The electrostatic chuck in claim 1, wherein said height adjustment mechanisms comprise one of screw type mechanisms, piezoelectric actuators, hydraulic actuators, hydraulic pistons, thermal actuators, and magnetic actuators .
- [c8] 8.An electrostatic chuck comprising:
height adjustment mechanisms; and
pins connected to said height adjustment mechanisms.
- [c9] 9.The electrostatic chuck in claim 8, wherein said height adjustment mechanisms individually control the height of each pin.
- [c10] 10.The electrostatic chuck in claim 8, wherein said height adjustment mechanisms control the flatness of a device being held by said pins.
- [c11] 11.The electrostatic chuck in claim 8, wherein said height adjustment mechanisms comprise computer-controlled devices.
- [c12] 12.The electrostatic chuck in claim 8, wherein said

height adjustment mechanisms comprise devices that automatically maintain a flatness of a device being held by said pins.

- [c13] 13. The electrostatic chuck in claim 8, wherein said height adjustment mechanisms comprise one of screw type mechanisms, hydraulic actuators, hydraulic pistons, piezoelectric actuators, magnetic actuators, and thermal actuators.
- [c14] 14. A system for maintaining a device flat on an electrostatic chuck, said system comprising:
 - an electrostatic chuck comprising height adjustment mechanisms and pins connected to said height adjustment mechanisms;
 - a measurement tool adapted to measure the flatness of a device held by said pins; and
 - a computer linked to said height adjustment mechanisms and said measurement tool, said computer being adapted to adjust said flatness of said device by adjusting said height adjustment mechanisms based on feedback from said measurement tool.
- [c15] 15. The system in claim 14, wherein said height adjustment mechanisms individually control the height of each pin.

- [c16] 16. The system in claim 14, wherein said height adjustment mechanisms control the flatness of said device being held by said pins.
- [c17] 17. The system in claim 14, wherein said height adjustment mechanisms compensate for foreign matter particles between said electrostatic chuck pins and said device being held by said electrostatic chuck pins.
- [c18] 18. The system in claim 14, wherein said height adjustment mechanisms comprise computer-controlled devices.
- [c19] 19. The system in claim 14, wherein said computer is adapted to change the shape of said device to conform to a pre-existing standard.
- [c20] 20. The system in claim 14, wherein said height adjustment mechanisms comprise one of screw type mechanisms, piezoelectric actuators, hydraulic actuators, hydraulic pistons, thermal actuators, and magnetic actuators.
- [c21] 21. A system for maintaining a device flat on an electrostatic chuck, said system comprising:
 - an electrostatic chuck comprising: a base plate; height adjustment mechanisms connected to said base plate;
 - and electrostatic chuck pins connected to said height

adjustment mechanisms;
a measurement tool adapted to measure the flatness of a device held by said electrostatic chuck pins; and
a computer connected to said height adjustment mechanisms and said measurement tool, said computer being adapted to adjust said flatness of said device by adjusting said height adjustment mechanisms based on feedback from said measurement tool.

- [c22] 22. The system in claim 21, wherein said height adjustment mechanisms individually control the height of each electrostatic chuck pin.
- [c23] 23. The system in claim 21, wherein said height adjustment mechanisms control the flatness of said device being held by said electrostatic chuck pins.
- [c24] 24. The system in claim 21, wherein said height adjustment mechanisms compensate for foreign particles between said electrostatic chuck pins and a device being held by said electrostatic chuck pins.
- [c25] 25. The system in claim 21, wherein said height adjustment mechanisms comprise computer-controlled devices.
- [c26] 26. The system in claim 21, wherein said computer changes the shape of said device to conform to a pre-

existing standard by adjusting individually said height adjustment mechanisms.

- [c27] 27.The system in claim 21, wherein said height adjustment mechanisms comprise one of screw type mechanisms, piezoelectric actuators, hydraulic actuators, hydraulic pistons, thermal actuators, and magnetic actuators.
- [c28] 28.A method of attaching a device to an electrostatic chuck, said method comprising:
attaching said device to electrostatic chuck pins of said electrostatic chuck;
measuring a flatness of said device; and
adjusting the height of said electrostatic chuck pins to correct any flatness errors determined in said measuring process.
- [c29] 29.The method in claim 28, wherein said adjusting process comprises adjusting height adjustment mechanisms connected between said electrostatic chuck pins and a plate of said electrostatic chuck.
- [c30] 30.The method in claim 29, wherein said adjusting process adjusts each height adjustment mechanism individually.
- [c31] 31.The method in claim 28, wherein said adjusting pro-

cess is performed using a computer connected to a measurement device and to height adjustment mechanisms.

- [c32] 32.The method in claim 28, wherein said adjusting process compensates for foreign matter particles between said electrostatic chuck pins and said device being held by said electrostatic chuck pins.
- [c33] 33.The method in claim 28, wherein said adjusting process changes the shape of said device to conform to a pre-existing standard.
- [c34] 34.The method in claim 28, wherein said measuring process is performed using an interferometer.
- [c35] 35.A method of attaching a device to an electrostatic chuck, said method comprising:
attaching said device to electrostatic chuck pins of said electrostatic chuck;
measuring a flatness of said device; and
adjusting the height of height adjustment mechanisms connected between said electrostatic chuck pins and a plate of said electrostatic chuck to correct any flatness errors determined in said measuring process.
- [c36] 36.The method in claim 35, wherein said adjusting process adjusts each height adjustment mechanism individually.

- [c37] 37.The method in claim 35, wherein said adjusting process is performed using a computer connected to a measurement device and to said height adjustment mechanisms.
- [c38] 38.The method in claim 35, wherein said adjusting process compensates for foreign matter particles between said electrostatic chuck pins and said device being held by said electrostatic chuck pins.
- [c39] 39.The method in claim 35, wherein said adjusting process changes the shape of said device to conform to a pre-existing standard.
- [c40] 40.The method in claim 35, wherein said measuring process is performed using an interferometer.